

Non-phlebotomine Psychodidae (Diptera, Nematocera) of southern Africa. I. Subfamily Psychodinae: *Pericoma*, *Clytocerus* and *Mystropsychoda* gen. n.

by

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SYNOPSIS

Descriptions are given of two new species of *Pericoma* Walker *sensu lato* that resemble *pulchra* Eaton and its allies in the Palaearctic but also have affinities with many species in southern Australia, New Zealand and southern South America. Seven new species of *Clytocerus* Eaton are placed in *Notoclytocerus* subg. n., and a synoptic key is given to all Ethiopian species of this group. *Mystropsychoda* gen. n., a very distinctive and isolated taxon with no clear affinities, is described from one new and two previously established African species.

INTRODUCTION

In spite of their biogeographical importance and relative accessibility, the Psychodidae of southern Africa¹ are still less well known than those of any part of the world except perhaps the eastern Palaearctic. Thus, apart from Phlebotominae, which I shall not consider, the only specifically southern African Psychodidae so far described are three species of *Nemopalpus* (Stuckenberg 1962), *Trichopsychoda africana* Satchell (Satchell 1955b) and *Neomaruina stuckenbergi* Vaillant (Vaillant 1963). Three further species are known to extend into southern Africa from the north (*Threticus dubitatus* (Tonnoir), *Psychoda dentata* Tonnoir, *Mormia flagellifer* (Freeman)) and seven other cosmopolitan or widely distributed species have been introduced from diverse non-African sources (*Clogmia albipunctata* (Williston); *Psychoda alternata* Say, *severini* Tonnoir, *cinerea* Banks, *penicillata* Satchell, *malleola* Tokunaga & Komyo, *savaiiensis* Edwards). In contrast, a substantial part of the psychodid fauna of northern Africa, south of the Sahara, amounting to some 53 species, was described by Tonnoir (1920, 1922, 1939a, 1939b) and Satchell (1955a). I am therefore delighted to have had the opportunity of working upon a large collection from the south, made by Professor G. H. Satchell in 1952-3 and Dr B. R. Stuckenberg of the Natal Museum in subsequent years. This collection shows that the species listed above are quite unrepresentative of the fauna as a whole. In particular, they do not disclose the presence of *Pericoma* Walker or give any hint that three of the dominant southern African genera are *Clytocerus* Eaton, *Neoarisemus* Botosaneanu & Vaillant and *Telmatoscopus* Eaton.

The Ethiopian psychodid fauna as I now perceive it is less diverse and far less endemic in character than the neotropical fauna, but probably more or less equivalent to that of the Oriental region. Of twenty non-phlebotomine genera recorded to date, only three (15%) are endemic as compared with ten (50%) in the neotropics; four (20%) are shared with the Holarctic alone; the remainder have a wider distribution, generally including both Holarctic and Oriental regions, but rarely the neotropics.

¹ For the purposes of this paper 'southern Africa' is defined as the African mainland, south of lat. 15°S.

Apparently only more or less cosmopolitan genera such as *Psychoda*, *Nemopalpus* and *Telmatoscopus* occur in the neotropics as well as Africa. Similarly, Fittkau (1971) finds that in Chironomidae, more than half the neotropical genera appear to be endemic, while only 'a few' genera are known solely from Africa. At this level the Ethiopian Psychodidae and Chironomidae may therefore be proportionately less endemic than the Ethiopian insect fauna as a whole, found by Handlirsch (1913) to be very distinct from the faunas of the Palearctic and Oriental regions, with an endemic/non-endemic ratio of 1 : 0,76 as compared with an only slightly higher ratio of 1 : 0,63 for the neotropics.

In the Ethiopian fauna the 'Antarctic' element is small. For example, in Plecoptera (Illies 1965), Ephemeroptera (Ross 1967) and Chironomidae (Brundin 1967) most antarctic groups occur in southern Australia-New Zealand and southern South America, but are absent from Africa and thus have distributions which are 'AS' (Hennig 1960) rather than Gondwanian. The Psychodidae appear to fit into this general pattern, with only two southern African species, *Pericoma drepanopenis* sp. n. and *P. stuckenbergi* sp. n., that could be considered to form part of a Gondwanian distribution. These species also have six relatives in North Africa and Europe, but I believe that the northern species represent a geologically recent extension, and that the overall pattern at a higher level will ultimately confirm a southern origin for their group. (See further discussion under 'Description of species'.)

It is unfortunate that little can be said at this stage about the biology of the African species. However, generalizations have been made from observations in other regions that are likely to prove equally valid for the African fauna, and these are described under the appropriate headings. As a general introduction it may be helpful to add that psychodids mostly breed in very moist places, and adults are likely to be found most abundantly in forests, in wooded kloofs, and on vegetation at the edges of streams, trickles and springs. The larvae of the species described in this paper will be elongated, amphipneustic and darkly pigmented, with each abdominal segment divided into three annuli and the dorsal surface often protected by a mass of vegetable debris held in place by stout curved setae.

MATERIAL AND METHODS

Most specimens in the collection are from South Africa (Cape Province, Natal and Transvaal) with a few from Rhodesia. The bulk of them were collected more than 20 years ago and it is therefore probable that the vestiture as described is faded from an originally darker hue. All specimens were pinned and a few had preparations of the genitalia or other parts, made by Satchell and attached to the pin beneath. Satchell also gave manuscript names, some of which he published prematurely without descriptions (Satchell 1956).

In working with this material, I have replaced most of Satchell's names. I have also made new preparations whenever undissected specimens were available, and in all instances these are on microscope slides, stained with acid fuchsin and mounted in Canada Balsam. All dimensions given are averages or ranges for the entire type series. The lists of 'Material examined' include only specimens positively identified from balsam preparations. The many other specimens in the collection have been placed under tentative labels, but would require maceration in caustic potash for reliable

identification. None the less I am certain that I have described most if not all of the new species represented in the collection. Since the distribution of the northern African species is unknown, the keys presented in this and subsequent papers will include the entire Ethiopian psychodid fauna and thus provide a useful synopsis as well as a means of identification. All types and other specimens will be returned to the Natal Museum.

COLLECTING AREAS

Dr Stuckenberg has kindly provided me with the following details of the areas in which he and Professor Satchell have collected.

Chirinda Forest, Rhodesia. Mature mixed hardwood forest at about 900 m near the southern end of the eastern highlands, close to the town of Mt Selinda. High summer rainfall.

Disa Gorge, Cape Town. On the south side of Table Mountain, containing indigenous mixed forest over a wide range of altitudes.

Du Toit's Kloof, west Cape. A mountain pass covering a wide range of altitudes, with typical Cape macchia vegetation throughout. Winter rainfall. Psychodids probably swept from streamside grass and sedges.

Fern Kloof, Grahamstown, east Cape Province. A small gorge containing poor forest and bush in an area of plantations. Summer and winter rainfall, probably about 900 mm. Altitude probably about 900 m.

Gwalaweni Forest, north Natal. Mixed indigenous forest on the Lebombo Range, south of Ingwavuma village, at 27°08'S, 31°59'E. Surrounded by relatively arid, hot country. Summer rainfall.

Indumeni Forest, Natal. Mixed *Podocarpus*-dominated forest at about 1 350 m, in a gorge between spurs projecting from the main Drakensberg escarpment.

Karkloof, Natal. Part of a long escarpment with many fine patches of upper montane climax forest, north-west of Pietermaritzburg. Most collecting between 1 370 m and 1 670 m. High summer rainfall and mists.

Magoeba's Kloof, Tzaneen, eastern Transvaal. A well-forested valley with large streams and waterfalls on the Drakensberg escarpment.

Nelspruit, eastern Transvaal. The precise collecting site is unknown, but Nelspruit is a town in sub-tropical, mountainous terrain, near spurs from the Drakensberg escarpment. Summer rainfall.

Oribi Gorge Reserve, south Natal. *Podocarpus* forest in a deep gorge. Summer rainfall.

Piri Forest, east Cape Province. *Podocarpus* climax forest on an escarpment at about 760 m. Summer rainfall and occasional winter snow.

Platteklip stream, Cape Town. Rises near the top of Table Mountain and runs downwards in a gorge that makes an oblique slash on the face of the mountain. The range of altitudes is wide, and the stream runs steeply in places, with shaded bushy banks from which the psychodids must have been swept. Winter rainfall.

Port St Johns, east Cape Province. Climax *Podocarpus* forest on prominent elevated hilltops overlooking the sea. Altitudes generally below 300 m. High summer rainfall.

Rhodes-Inyanga National Park, Rhodesia. A very mountainous section of the northern part of the eastern highlands, with many streams in bushy gorges, but no forest. Specimens probably collected at about 1 500 m. High summer rainfall.

Skeleton stream, Cape Town. Runs down the eastern side of Table Mountain through a wide range of altitudes. The upper reaches are in the macchia zone and psychodids were presumably swept from bushes and grass overhanging the stream; the lower reaches pass through evergreen mixed indigenous forest. Winter rainfall.

Tokai Forest, Cape Town. An area of plantations on the Cape Peninsula in terrain of varying altitude. *Town Bush*, Pietermaritzburg, Natal. Indigenous forest at about 1 050 m on an escarpment overlooking Pietermaritzburg; much abused by early settlers, but now with secondary regrowth. Summer rainfall and heavy mists, about 1 015–1 030 mm.

Vumba Mountain, Rhodesia. Closed evergreen forest with streams on the eastern highlands south of Umtali, at about 1 370 m. Summer rainfall.

Westfalia, eastern Transvaal, 23°44'S, 30°07'E. A railway siding near Tzaneen. The conditions are probably similar to those at Magoeba's Kloof, but with less forest.

Zuurberg Range, east Cape Province. No forest; mainly macchia vegetation. Summer and winter rains.

ACKNOWLEDGEMENTS

I am greatly indebted to Professor Satchell, who made the original collection, and to Dr Stuckenberg, who has continued to collect Psychodidae and who made this

study possible by sending me the accumulated material. Some of the material submitted by Dr Stuckenberg was collected during field trips subsidized by the South African Council for Scientific and Industrial Research.

DESCRIPTIONS OF TAXA

Genus *Pericoma* Walker *sensu lato*

Pericoma Walker, 1856, *Insecta Britannica* 3: 256.

Type-species: *Trichoptera trifasciata* Meigen, by designation of Coquillett, 1910: 587.

This large world-wide 'genus' is certainly polyphyletic, but the group is so incompletely known that most segregates that could be named at present are likely to be premature and confusing. One exception is the *pulchra* group, containing two new South African species and the Palearctic *pulchra* Eaton, *nigricauda* Tonnoir, *obtusa* Tonnoir, *anderssoni* Nielsen, *atlantica* Satchell and *mollis* Satchell, in which males have a complex asymmetrical aedeagus, a broad dorso-ventrally flattened basal apodeme with a large concavity at the base, and the coxites connected ventrally by a plate-like ventral apodeme with a thickened median groove. Both sexes have the last three antennal segments reduced. This is an exceptionally interesting group because the above features, which are apparently apomorphic, are shared by many species of *Pericoma* s.l. in Australia, New Zealand and South America together with some other southern genera. They are also shared by the European *Pericoma* (*Lobulosa*) *pollex* Berdén and *transsylvanica* Szabó which appear to have a southern origin. With the exception of three problematical species in the Nearctic, other northern species of *Pericoma* have a symmetrical aedeagus of a quite different type.

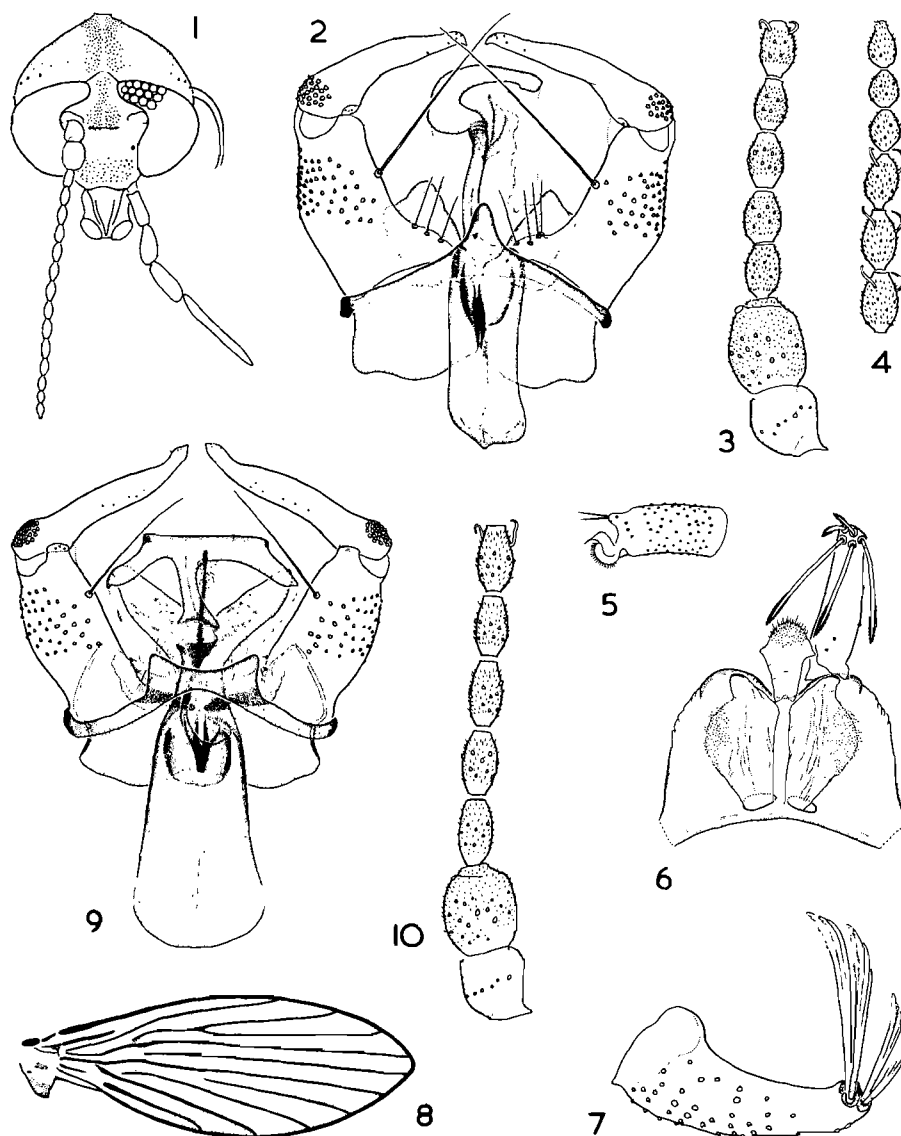
It is surely more than coincidence that the two northern species of *Pericoma* s.l. with asymmetrical male genitalia and the other features described above that have been observed alive (*pulchra*, *pollex*) fold their wings loosely when at rest, as do a high proportion of southern species. The many northern species with symmetrical genitalia that I have watched alive hold their wings in the primitive horizontal position, thus further reinforcing my opinion that we are dealing here with two fundamentally distinct phylogenetic lines. The posture of the new South African species of the *pulchra* group has not been observed, but I predict that when it is the wings will be seen to be folded loosely at the sides of the body. It is also probable that, like *pulchra*, these species have dorsoventrally flattened larvae without a covering of detritus that are found, like *Dixa* larvae, in water films on the surfaces of half-submerged stones, leaves and other objects at the edges of clear streams or pools. For a description of the larva of *pulchra* see Satchell (1949).

Pericoma drepanopenis sp. n.

Pericoma consimilis Satchell, 1956: 399. *Nomen nudum*.

A small fly, with variegated, light-brown and white vestiture, the aedeagus with the distal element sickle-shaped and the ninth sternite with a triangular median process. Female unknown.

Male. Head (fig. 1) slightly broader than long, with vertex inflated behind eyes; clypeus short. Eyebridges of three facet rows, separated by distance equal to 3.8–3.9 facet diameters, somewhat tapered towards midline; interocular suture represented by cuticular spurs, faint at tips, subtending angle of about 105°. Vertex with larger



Figs 1-10. (1-8) Holotype male of *Pericoma drepanopenis* sp. n.: (1) head; (2) coxites, styles and aedeagus; (3) base and (4) tip of antenna; (5) lateral view of last tarsal segment; (6) ninth tergite, cercopod and anal flap; (7) lateral view of cercopod; (8) wing, showing pattern of sclerotization. (9-10) Holotype male of *Pericoma stuckenbergi* sp. n.: (9) coxites, styles and aedeagus; (10) base of antenna.

scars concentrated on either side of scar-free median band; sparse fine scars laterally; postocular scars and curved bristles as shown. Frons with anterior scars partly divided by median scar-free band; posterior scars undivided, forming broad median band between eyebridges to beyond level of posterior row of facets. Clypeus with some enlarged scars laterally. Anterior tentorial pits nearer clypeal scar patch than patch on frons. Palpi (1-1,1 — 1,2-2,5) 1,2 times length of head, without hyaline sensory rods, 2nd and 3rd segments inflated. Antenna (figs 3-4) 16-segmented, only 1,4 times length of palp and 0,3 times length of wing; scape only 0,8 times length of pedicel, encircled by single line of scars; 3rd to 6th antennal segments short, 0,62-0,67 times length of pedicel, without ascoids; 7th to 14th segments each with two short, curled, digitate ascoids; last three segments about 0,4-0,5 times length of pedicel, without ascoids; 14th segment 0,8 times length of 13th; apiculus short, poorly delimited.

Wing as in fig. 8; fringe long, pale bronze-brown, with six white interruptions, including a long one round apex of wing between tips of R_4 - M_1 . Body of wing with white erect hair forming irregular transverse bands across wing, one roughly at level of tip of M_4 , another basal to level of Cu; on denuded wing, membrane and veins are colourless in these regions, brownish elsewhere. Radial and medial forks at about level of tip of Cu; medial fork with M_2 incomplete, lacking hair scars at base; first basal cell far longer than second, but apex indistinct; R_{2+3} incomplete, lacking scars at base, origin before level of apex of first basal cell; apex of wing between tips of R_4 - R_5 . Wing length, 1,7 mm.

Legs white, with brown band across middle of tibia, brown elements at tip of tibia, and last four tarsal segments brown. Last tarsal segment slightly produced on dorsal side above claws (fig. 5).

Abdominal vestiture white with transverse brown band dorsally on 6th or 7th segment. Genitalia (figs 2,6-7) with distal piece of aedeagus a sickle-shaped element, articulating with a curved bar connecting it to the basal apodeme; a leaf-shaped structure is attached to the curved bar, basal to this articulation; whole intromittent region of aedeagus is invested in an indistinct membranous sheath. Basal apodeme parallel sided, dorso-ventrally flattened, keeled. Ninth sternite with large median naked lobe, projecting backwards above base of aedeagus. Coxite with stout seta, longer than coxite, on inner side; coxite produced towards midline at base to form process set with row of 3-4 fine sensory setae; style shorter than coxite with pointed beak at tip, curved backward towards aedeagus. Ventral apodeme with pair of triangular posterior lobes on either side of aedeagus at base, and pair of large quadrate anterior lobes extending forward to level well beyond middle of basal apodeme. Ninth tergite with pair of pseudospiracular openings at base, set close together; hair scars on ventral side in two widely separated groups at level of base of anal flap; dorsal sclerites with longitudinal corrugations and lateral patches of microsetae. Anal flap strongly microsetose at tip. Cercopods about as long as ninth tergite, with sparse hair scars and five retinacula with fringed tips.

Material examined: Holotype ♂, SOUTH AFRICA, E. Transvaal, near Nelspruit, 20.4.1953 (G. H. Satchell, 1088). Paratypes: 2 ♂, with holotype. Other specimens: 1 ♂, with holotype; 1 ♂, Karkloof, Natal, 1.6.1953 (G. H. Satchell). Satchell (1956) recorded a single male taken in the Royal Natal National Park.

***Pericoma stuckenbergi* sp. n.**

A somewhat larger and darker fly than *drepanopenis*, but with similarly variegated vestiture. Differing from *drepanopenis* mainly in the structure of the male genitalia, in which the distal element of the aedeagus is T-shaped, and the ninth sternite has a pair of triangular processes flanking a shallow median concavity.

Male. Structure of head as in *drepanopenis*, but with eyebridges separated by distance equal to 3,8–4,6 facet diameters. Palpi, 1–1,1 — 1,1–2,3. Antenna 1,56 times length of palp and 0,31 times length of wing; 3rd to 6th antennal segments (fig. 10) more elongate than in *drepanopenis*, 0,7–0,8 times length of pedicel; 14th segment 0,7 times length of 13th. Head vestiture of brownish-white hair.

Wing fringe long, bronze-brown, with eight white interruptions, including a long one round apex of wing from just before tip of R_4 to M_1 . Body of wing with bronze-brown and white erect hair, the white forming two irregular transverse bands, one roughly at level of tip of M_4 , another basal to level of tip of Cu. Coloration and venation of denuded wing more or less as in *drepanopenis*. Wing length, 1,9–2,1 mm.

Abdomen with vestiture brownish-white except for brown areas laterally towards tip. Genitalia (fig. 9) with aedeagus broader and more robust than in *drepanopenis*; distal piece T-shaped, median bar articulating with process arising asymmetrically from one side of basal apodeme, lateral bars angled diagonally forward to meet pair of broad tapered processes with rounded tips that appear to have no homologue in *drepanopenis*. Basal apodeme larger than in *drepanopenis*, broadening anteriorly. Ninth sternite lightly sclerotized, naked, with pair of triangular processes flanking shallow median concavity. Coxite with stout seta, shorter than coxite, on inner side in distal half; coxite relatively narrow at base, basal process smaller than in *drepanopenis*, the sensory setae reduced and separated from it. Style shorter than coxite, distal region inflated as shown. Ventral apodeme with posterior lobes small. Ninth tergite and its appendages as in *drepanopenis*.

Female. Vestiture, structure of head and wing venation as in male except for details of proportion. Subgenital plate (fig. 19) squat; distal lobes separated by rather shallow apical concavity, sensory setae long. Dorsal flap (*f* in figure) large, broader than distal lobes, naked. Small cluster of genital sensilla (*s*) appearing as colourless spots on pale-brown sclerotized background. Spermathecae with irregular radial striations; apodemes as shown. Ovipositor (fig. 18) 1,2–1,3 times length of subgenital plate, cerci very spinose on inner sides and with row of 4–5 peg-shaped sensilla dorso-laterally.

Material examined (all coll. G. H. Satchell): Holotype ♂, SOUTH AFRICA, Cape Town, Platteklip stream, 1.12.1952 (Satchell No. 35). Paratypes: 1 ♂, 1 ♀ (allotype) and 1 ♀, with holotype; 1 ♂, same locality, 3.12.1952; 1 ♂, 2 ♀, same locality, 23.12.1952; 1 ♂, Cape Town, Kirstenbosch, small stream, 29(?) .12.1952. Other specimens: 2 ♂, with holotype; 2 ♂, same locality, 3.12.1952 and 23.12.1952; 1 ♂, Cape Town, Kirstenbosch, Skeleton stream, 5.12.1952; 1 ♂, Cape Town, Tokai Forest, 5.1.1953.

I name this species for Dr B. Stuckenberg.

Genus *Clytocerus* Eaton

Clytocerus Eaton, 1904: 59.

Synseodais Enderlein, 1937: 92.

Type-species: *Pericoma dali* Eaton, 1893, by designation of Enderlein, 1935: 247.

Clytocer resembles *Pericoma trifasciata* Meigen and many other northern hemisphere species of that genus in the shape of the distal flagellar segments and in the symmetry and general structure of the male genitalia. However, males also differ from these species in a series of apomorphic features that make this one of the most distinctive psychodid genera. These features include (i) the presence of corniculae (occasionally lost secondarily); (ii) fusion of the first two flagellar segments to form a compound segment; (iii) presence of a large brush of undulate clavate setae at the apex of the compound segment; (iv) presence of hirsute sensory organs ('hirsute glands' of Newstead 1912) on most antennal segments; (v) extreme elongation of the scape; (vi) division of the frontal hair scars into two groups separated by a median scar-free band; (vii) longitudinal ridging or furrowing of the head capsule, generally combined with presence of an unsclerotized band, extending from frontal scars to eyebridges.

This genus is well represented in the Ethiopian Region, where there are twelve known species, as compared with eight in the Palaearctic and one in the Nearctic. Unfortunately there are no records of the habit or immature stages of the African species, but it is probable that they will resemble non-African species in these regards. Thus, I would expect to find that they hold their wings horizontally and breed at the outer edges of the fresh-water marginal zone. The larvae are likely to resemble those of *ocellaris* (Meigen) and *rivosus* (Tonnoir) in being highly specialized, dark and profusely setose, with siphons short and bluntly rounded at the posterior end, dorsal siphonal processes strongly reduced, and antennae raised on large dome-shaped prominences. For a description of the immatures of *rivosus* see Jung (1956).

Males of the African forms have an aedeagus with four distinct processes, while Holarctic forms have a compact, rounded aedeagus of the general type seen in *trifasciata* and most other northern species of *Pericoma*. I am placing the African forms in the following new subgenus.

Subgenus *Notoclytocer* subg. nov.

Derivation: *Notos* (Gr.) = South + *Clytocer*.

Gender: Masculine.

Type-species: *Clytocer* (*Notoclytocer*) *tauricornis* sp. n., by present designation.

Male. Aedeagus with four backwardly directed, brown, sclerotized processes, pointed or fringed at tips. Style rounded apically, often constricted and curved outwards beyond hair scars, concave on outer side. First (compound) flagellar segment elongate, with distinct constricted waist midway from base to apex.

Type-species: *Clytocer* *tauricornis* sp. n.

Distribution: African mainland, south of the Sahara.

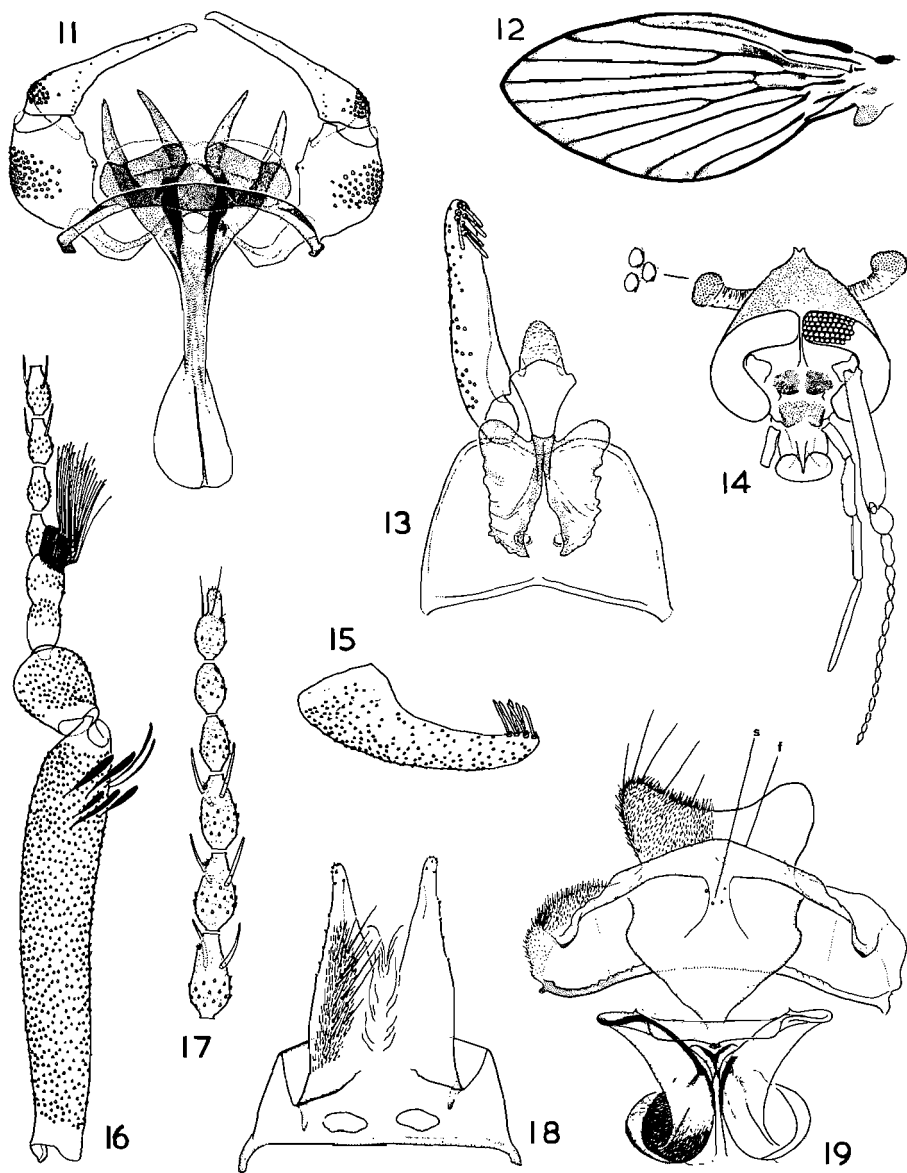
Key to males of the subgenus *Notoclytocer* (excluding *flavitorsis* (Enderlein))

1. Aedeagus with intromittent region enclosed dorsally and laterally by a cuticular hood or capsule, from which one or both pairs of aedeagal processes project to some extent. 2
- Aedeagus not enclosed. 6
2. Both pairs of aedeagal processes thorn-like, sharply pointed. 3
- Inner processes with tips broad and fringed. 4

3. Aedeagal capsule broad, rounded, unconstricted (fig. 42) (South Africa).....
palliolatus sp. n.
- Capsule strongly constricted in distal half (fig. 49) (South Africa, Rhodesia)....
constrictus sp. n.
4. Under high magnification, outer processes have narrow fringed tips; inner processes incrassate in distal third (Uganda).....**fasciatus** Tonnoir
- Outer processes with tips pointed, not fringed; inner processes not incrassate distally.....5
5. Inner fringed processes projecting well beyond level of outer pointed processes; outer processes bent outwards rather sharply, forming distinct angle on inner margin (Uganda).....**carbonarius** Tonnoir
- Inner fringed processes almost equal in length to outer pointed processes; outer processes curved smoothly outwards, not angulated (Nigeria)..**africanus** Tonnoir
6. Aedeagal processes widely separated, equal in size and length (fig. 11); thorax with dorsal crest of pale hair, as long as scape, curving forward over pile of short dark scales (South Africa).....**tauricornis** sp. n.
- Aedeagal processes usually close-set, always unequal in size and length; dorsal side of thorax without crest or pile of scales.....7
7. Larger processes irregularly stepped on outer side (fig. 26) (South Africa).....
zuluensis sp. n.
- Larger processes not stepped.....8
8. Outer processes larger than inner; style not conspicuously concave on outer side (fig. 23) (South Africa).....**inequalis** sp. n.
- Outer processes smaller than inner; style strongly concave on outer side.....9
9. Corniculae present. Outer processes less than half length of inner (fig. 38) (Rhodesia).....**corniculatus** sp. n.
- Corniculae absent. Outer processes more than half length of inner.....10
10. Aedeagal sheath with well-developed lateral areas of sclerotization; inner processes strongly divergent, often almost touching outer processes; style deeply concave on outer side immediately beyond hair scars (fig. 40) (South Africa)..
divaricatus sp. n.
- Aedeagal sheath with lateral areas of sclerotization small and inconspicuous; inner processes generally less strongly divergent, well separated from outer processes; concavity of style less deep and less basal (fig. 31) (Kenya, South Africa, Rhodesia).....**chyuluensis** Satchell

Further general features of *Notoclytocerus* spp.

Male and Female. Exoskeleton brown, well sclerotized. Head with postocular bristles and scars lateral only; clypeus short and broad; frons overhanging anterior tentorial pits at sides, its scar patches narrowly separated from clypeal scar patch. Palpi with fine, elongate hyaline sensory rods (staining pink with acid fuchsin) on outer side of 2nd segment; 1st segment with about ten dome-shaped sensilla, about size of hair scars, on inner side. Antenna with hirsute sensory pits on most segments; scape with distal articulatory processes enlarged; last three segments reduced; ascoids digitate.



Figs 11-19. (11-17) *Clytocerus (Notoclytocerus) tauricornis* sp. n., male: (11) coxites, styles and aedeagus of holotype; (12) wing; (13) ninth tergite, cercopod and anal flap; (14) head; (15) cercopod of holotype; (16) base of antenna; (17) tip of antenna, drawn to larger scale. (18-19) *Pericoma stuckenbergi* sp. n., female: (18) ninth tergite with cerci (ovipositor); (19) subgenital plate and spermathecae of allotype (s, genital sensilla; f, dorsal flap).

Prothorax well developed, brown, with numerous hair scars divided into two groups by median scar-free band. Wing with first basal cell far longer than second, but apex indistinct, marked only by infuscation; origin of R_{2+3} from first basal cell at distance before its apex equal to about twice its width; band of infuscation on membrane between R_1 and basal half of R_{2+3} ; conspicuous spot of infuscation at tip of Sc.

Male. Antenna 15-segmented. Aedeagal processes generally appearing longitudinally ridged or striated towards tips. Coxite shorter than style.

Female. No corniculae, even when present in male. Eyebridges of four facet rows. Antenna 16-segmented; scape far shorter than in male; 3rd and 4th segments not fused; no brush of undulate clavate setae on post-pediceal.

tauricornis group

Aedeagus without capsule, its processes large, widely separated; style not conspicuously concave on outer side.

Clytocerus (Notoclytocerus) tauricornis sp. n.

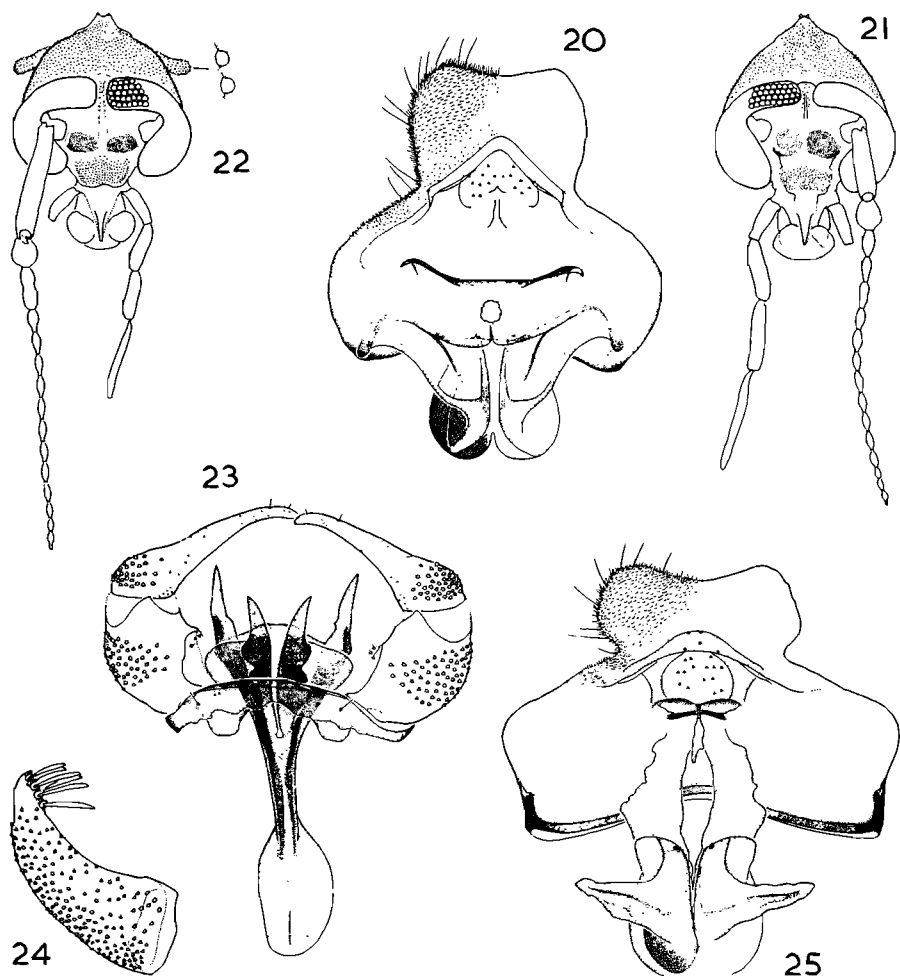
A large brown species, the male with a prominent dorsal thoracic crest, exceptionally long antennal scape, and equally developed, widely separated aedeagal processes.

Male. Head vestiture dark brown, lighter on clypeus and mouthparts. Denuded head (fig. 14) 0,99 times as long as broad, with vertex slim, acute, tapered rather evenly from eyebridges to base; corniculae large, inflated distally, with narrow-based button sensilla (inset to fig. 14). Eyebridges of six facet rows, narrowly separated by distance equal to 0,1–0,7 facet diameters. Head capsule colourless and unsclerotized in furrow, in zone between eyebridges, and in crescentic area immediately behind eyebridges. No interocular suture. Vertex with scars sparse medially. Frons bulging. Palpi (1–1,55 — 1,65–2,4) 1,4 times length of head. Antenna (figs 16–17) only 1,5 times length of palp and 0,4 times length of wing; scape and pedicel thickly clothed in dark-brown scales; scape 0,8 times length of head and 4,4 times length of pyriform pedicel; pedicel 0,9 times length of post-pedicel. Flagellum with verticillar hairs sparse, spreading, greyish; two hirsute sensory pits on 4th antennal segment, one on 8th–13th and two on 14th–15th; pair of ascoids on 6th–12th segments; 13th segment 0,76 times length of 12th.

Thorax with pile of short dark-brown scales on anterior notum, and more posteriorly a crest of pale hair, as long as scape, curving forward. Wing (fig. 12) with fringe whitish from R_2 – M_2 ; rows of whitish erect hair on all veins except R_1 , R_5 and M_4 ; membrane with light-brown to brown infuscation as shown. Tip of R_4 placed slightly above pointed apex of wing; medial fork slightly basal to level of tip of Cu; radial fork basal to medial. Wing length, 3,1–3,3 mm.

Legs dark brown with cream-coloured tarsi.

Abdominal and genital vestiture pale. Genitalia (figs 11, 13, 15) with aedeagus very broad between coxites; bases of aedeagal processes covered by pair of large sclerotized dorsal plates; processes equal, pointed, with faint and irregular longitudinal striations; on each side, inner process converges towards outer. Basal apodeme with long narrow neck region expanding into paddle-shaped, keeled free end. Ninth sternite well-sclerotized, broadened in midline, anterior margin clearly visible. Coxite inflated



Figs 20–25. (20–21) Allotype female of *Clytocerus (Notoclytocerus) tauricornis* sp. n.: (20) subgenital plate and spermathecae; (21) head. (22–24) Holotype male of *Clytocerus (Notoclytocerus) inequalis* sp. n.: (22) head; (23) coxites, styles and aedeagus; (24) cercopod. (25) Allotype female of *Clytocerus (Notoclytocerus) zuluensis* sp. n.: subgenital plate and spermathecae.

laterally in region covered densely with hair scars; few minute sensory setae on inner side. Style with outer side almost completely straight beyond patch of scars. Ninth tergite (fig. 13) with pair of small pseudospiracular openings, close-set; ventral hair scars divided into two small groups by narrow scar-free band; cercopod with 7–9 short retinacula.

Female. Vestiture paler than in male; on head and dorsal thorax, more of a honey-brown; thorax without pile or crest.

Head (fig. 21) with vertex rather less slim than in male. Eyebridges separated by distance equal to 1.9 facet diameters, connected by curved interocular suture. Head capsule without furrow, but with colourless unsclerotized band extending backward

from hair scars on frons through patch of scars between eyebridges; small colourless zone behind interocular suture. Palpi (1-1,5 — 1,6-2,4) 1,5 times length of head, stouter than in male. Antenna 1,4 times length of palp and 0,4 times length of wing; scape only 0,4 times length of head and 2,3 times length of pedicel, but flagellum compensatingly long; pedicel 1,18 times length of post-pedicel. Two hirsute sensory pits on 4th-5th antennal segments, one on 9th-13th, 2 on 14th-16th. Ascoids on 5th-13th antennal segments. Fourteenth antennal segment 0,7 times length of 13th.

Wing length, 3,2-3,4 mm.

Subgenital plate (fig. 20) with shoulders very rounded and base constricted; distal lobes separated by shallow apical concavity, sensory setae short. Dorsal flap angular, narrower than distal lobes, naked. Genital sac with sensilla appearing as colourless spots on pale brown sclerotized background. Spermathecal sculpturing reticulate; apodemes as shown, partly fused in midline to leave rounded aperture at level of lateral wings. Ovipositor 2,1 times length of subgenital plate; cerci slender, curved, truncate at tips, each with row of 8-10 setae on inner side in basal half, and row of about eleven peg-shaped sensilla dorso-laterally.

Material examined (all coll. G. H. Satchell): Holotype ♂, SOUTH AFRICA, Cape Town, Kirstenbosch, upper reaches of Skeleton stream, 10.12.1952 (Satchell No. 200). Paratypes: 1 ♂, 1 ♀, with holotype; 2 ♂, same locality, 27.12.1952 and 3.1.1953; 1 ♀ (allotype) and 1 ♀, same locality, 14.1.1953; 1 ♀, same region, lower reaches of Skeleton stream, 8.12.1952; 1 ♂, same region, Skeleton stream, 9.7.1953; 1 ♂, Cape Town, Tokai Forest, 5.1.1953; 1 ♂, Cape Town, Table Mt, Disa Gorge, 14.12.1952. Other specimens: 1 ♂, near Knysna, Bracken Hill stream, 11.2.1953; 2 ♂, Ashton, Klaas Vooges Kloof, 4.2.1953; 1 ♂, Cape Town, Platteklip stream, 1.12.1952.

***Clytocerus (Notoclytocerus) inequalis* sp. n.**

Differs from *tauricornis* primarily in the proportions of the head and its appendages, the unequal development of the aedeagal processes, the inner being far shorter than the outer, and the more undulate shape of the style. The vestiture is relatively pale. The female is unknown.

Male. Partly denuded; remaining vestiture pale, brownish-white to brown and grey-brown.

Head (fig. 22) 0,98 times as long as broad, with vertex short, inflated, especially at level of corniculae, obtuse; clypeus longer than in *tauricornis*; corniculae small, with colourless dome-shaped sensilla (inset to fig. 22) rather regularly arranged on distal third. Eyebridges of five facet rows, separated by distance equal to 1,4 facet diameters. Well-defined colourless unsclerotized band extending backward from hair scars on frons, through patch of scars between eyebridges to small colourless zone in region normally occupied by interocular suture. Vertex with scars as numerous in midline as elsewhere. Frons strongly bulging. Palpi (1-1,2 to 1,2-1,9) only 1,2 times length of head. Antenna 2,0 times length of palp and 0,46 times length of wing; scape and pedicel clothed in brownish-white hair and scales. Scape shorter than in *tauricornis*, only 0,65 times length of head and 3,85 times length of pedicel, but flagellum proportionately longer. Pedicel subspherical, 0,71 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th-12th, two on 13th and

apparently only one on 14th–15th; single ascoid on 4th, pair on 5th–12th segments. Thirteenth segment 0,77 times length of 12th.

Remaining thoracic vestiture whitish, apparently without pile or crest. Wing as in *tauricornis*, but with tip of R_4 placed almost exactly at apex of wing, medial fork at level of tip of Cu, and conspicuous discrete thickenings on several veins, especially R_3 , M_3 and Cu. Wing length, 2,9 mm.

Legs light brown to grey-brown, with brownish-white scales on dorsal sides, at tips of tibiae and tarsal segments.

Genitalia (figs 23–24) with aedeagus broad between coxites; dorsal plates at bases of aedeagal processes less developed than in *tauricornis*; inner processes far shorter than outer, enlarged and darkly sclerotized at bases. Ninth sternite with sensory seta above base of each coxite; posterior margin with dark, thickened rim, anterior margin indistinct, undulate. Coxite rather less inflated than in *tauricornis*; style slightly sinuous on outer side beyond patch of scars; distal sensory setae elongate. Ninth tergite with pseudospiracular openings fused; dorsal sclerites not corrugated as in *tauricornis*; anal flap far more elongate; cercopod stout; five retinacula, larger than in *tauricornis*.

Material examined: Holotype ♂, SOUTH AFRICA, Paarl district, W. Cape, Du Toit's Kloof, 900–1 370 m, 27–28.9.1959 (B. & P. Stuckenberg).

zuluensis group

Aedeagus without capsule, its processes large, close-set, the inner larger than the outer; style constricted and curved outwards beyond hair scars, concave on outer side.

This group contains *chyuluensis* Satchell and two new species.

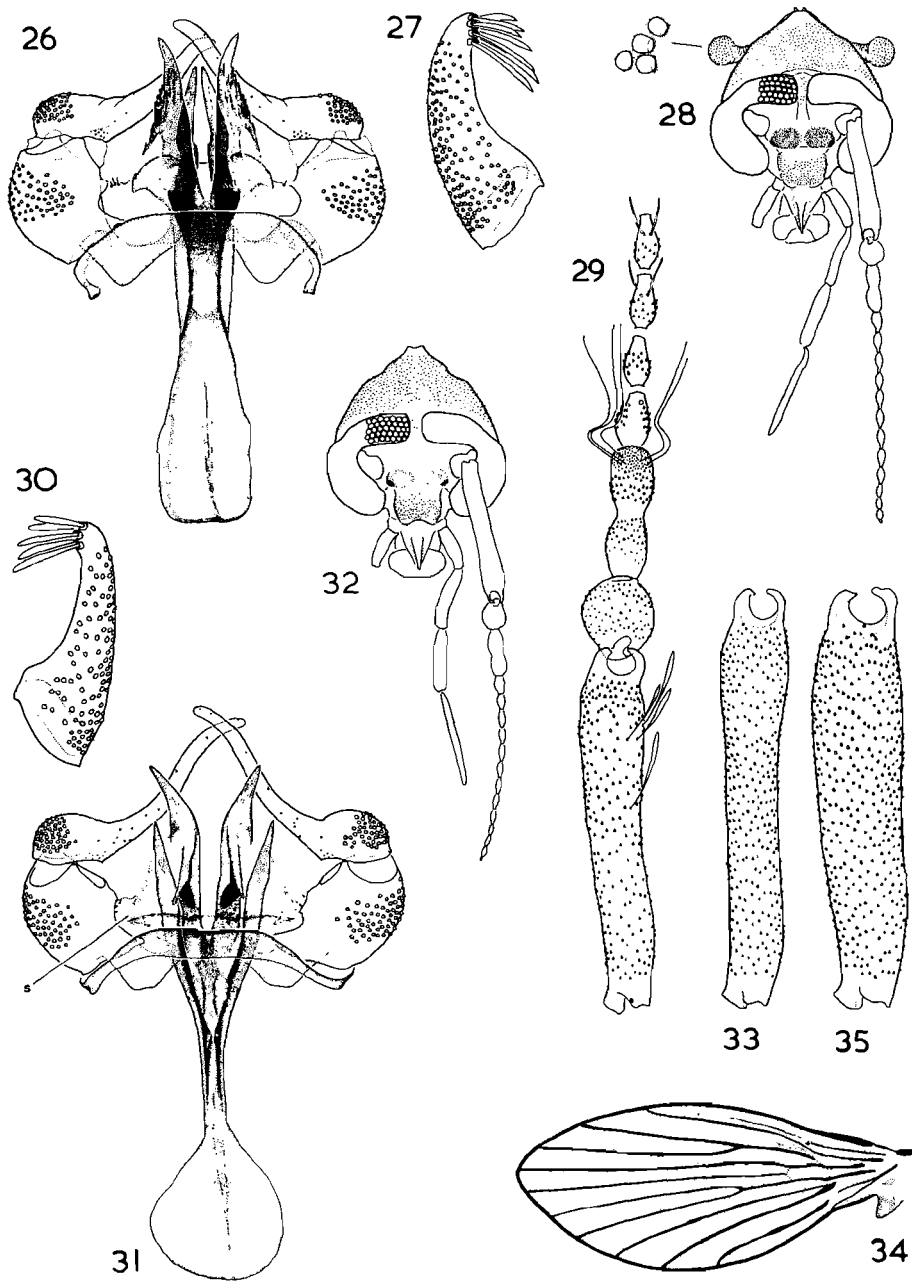
Clytocerus (*Notoclytocerus*) *zuluensis* sp. n.

A large pale species without specialized crests or tufts. The aedeagus has the small outer processes twisted into a medial ventral position so that their tips can be seen between the large inner processes. The inner (morphologically outer) processes are irregularly stepped on the outer sides.

Male. Vestiture brownish-white to pale brown.

Denuded head (fig. 28) 0,98 times as long as broad, with vertex inflated, obtuse; corniculae inflated distally with tall dome-shaped sensilla (inset to fig. 28). Eyebridges of five facet rows, separated by distance equal to 1,3–1,4 facet diameters. Head capsule raised into low unsclerotized ridge from frontal scar patches through patch of scars between eyebridges to colourless band in region normally occupied by interocular suture. Vertex with scars rather sparse in midline (holotype) or evenly scattered (paratypes). Palpi (1–1,4 — 1,5–2,2) 1,48 times length of head. Antenna (fig. 29) 1,54 times length of palp and 0,39 times length of wing; scape and pedicel clothed in pale brownish hair and scales; scape 0,67 times length of head and 4,05 times length of pedicel. Pedicel subspherical, 0,64 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th–12th, two on 13th–15th; pair of ascoids on 6th–12th segments. Thirteenth segment 0,72 times length of 12th.

Wing brown, with indistinct pale-brown section of fringe between R_2 – M_2 ; erect hair brownish-white to brown. Infuscation of membrane and venation much as in previous species, but both forks well basal to level of tip of Cu, tip of R_4 placed



Figs 26–35. (26–29) *Clytocyclus* (*Notoclytocyclus*) *zuluensis* sp. n.; male: (26) coxites, styles and aedeagus of holotype; (27) cercopod of holotype; (28) head; (29) base of antenna. (30–34) *Clytocyclus* (*Notoclytocyclus*) *chyuluensis* Satchell, male: (30) cercopod; (31) coxites, styles and aedeagus (s, lateral area of sclerotization); (32) head; (33) scape; (34) wing. (35) *Clytocyclus* (*Notoclytocyclus*) *divaricatus* sp. n.: scape of holotype male.

distinctly above apex of wing, and no conspicuous thickenings on veins. Wing length, 3,4 mm.

Legs brown with creamy tarsae.

Genitalia (figs 26-27) with aedeagus narrow between coxites; no dorsal plates present as in *tauricornis* or *inequalis*. Inner aedeagal processes long, broad-based, pattern of sclerotization giving a barbed appearance; tip curved outwards; outer surface almost toothed, irregularly stepped in profile. Outer aedeagal processes shorter and more slender than inner, twisted into midventral position, with tips visible from above between inner processes. Basal apodeme broad at narrowest part, rather narrow and truncate at free end. Ninth sternite with sclerotized, distinct, rounded posterior margin and indistinct, colourless anterior margin; sensory seta sometimes present near base of coxite (lacking in holotype). Coxite shorter than style, inflated laterally; 3-4 short sensory setae on membrane connecting coxite to aedeagus. Style with constriction beyond hair scars more gradual than in *chyuluensis* or *divaricatus* and concavity less deep; blade tapered. Ninth tergite with pseudospiracular openings close-set, partly fused in holotype; dorsal sclerites not corrugated. Cercopod with about eleven retinacula.

Female. Vestiture somewhat darker than in male.

Head with vertex acute, less inflated than in male. Eyebridges separated by distance equal to 2,5 facet diameters, connected by curved interocular suture. Patch of scars between eyebridges; indistinct band of lesser sclerotization extending from scars on frons to scars between eyebridges; crescent of colourless cuticle immediately anterior to interocular suture. Palpi (1-1,5 — 1,5-2,2) 1,45 times length of head. Antenna 1,59 times length of palp and 0,37 times length of wing; scape only 0,39 times length of head and 2,35 times length of pedicel; pedicel equal in length to post-pedicel. Two hirsute sensory pits on 4th-5th antennal segments, one on 9th-14th, two on 15th-16th. Pair of ascoids on 5th-13th segments. Fourteenth segment 0,73 times length of 13th.

Wing length, 3,5 mm.

Subgenital plate (fig. 25) with shoulders angular and broader than base; distal lobes short and broad, separated by shallow apical concavity, sensory setae short. Dorsal flap rounded, narrower than distal lobes, naked. Genital sac with sensilla appearing as colourless spots on pale-brown sclerotized background. Spermathecal sculpturing indistinct, reticulate. Apodemes including pair of narrow plates with irregular margins linking spermathecal complex to region of genital sac, and pair of straight, tapered, wing-like apodemes projecting laterally at level of spermathecae. Ovipositor 2,55 times length of subgenital plate; cerci slender, curved, each with 8-10 setae on inner side in basal half, and about ten peg-shaped sensilla dorso-laterally.

Material examined (all coll. G. H. Satchell): Holotype ♂, SOUTH AFRICA, Natal, Pietermaritzburg, Town Bush, 18.6.1953 (Satchell No. 1517). Paratypes: 1 ♂, same locality, 11.6.1953; 1 ♂, 1 ♀ (allotype), same locality, 20.6.1953. Other specimen: 1 ♂, N.E. Transvaal, near Tzaneen, Magoeba's Kloof, 1.5.1953.

Clytocer (*Notoclytocer*) *chyuluensis* Satchell

Satchell, 1955, *Revue Zool. Bot. afr.* 51: 347-348; fig. 1 (♂ only).

This species, described from the Chyulu Hills in Kenya, is widely distributed in southern Africa, but southern specimens differ from Satchell's types in a number of

minor respects including the width of the eyebridges (five rows of facets instead of four) and the more slender scape and aedeagus. Moreover, the southern populations are themselves variable and I suspect that we are dealing here with a complex of sibling species that will resist partitioning until examined in far greater detail, with the aid of very extensive collecting and perhaps non-structural characters.

Satchell's description was brief and based upon only two males. I have therefore given a full description of a series from Piri Forest, King William's Town, and listed some of the major variations observed in material from other southern localities.

A mainly brown species without specialized crests or tufts, the male lacking corniculae, and with its aedeagus as in fig. 31: the larger processes not stepped on their outer surfaces and the aedeagal sheath with its lateral areas of sclerotization (*s* in fig. 31) small, as shown.

Male. (Piri Forest series.) Vestiture on head and its appendages brown. Denuded head (fig. 32) 0,97 times as long as broad, with vertex inflated, obtuse; corniculae absent. Eyebridges of five facet rows, separated by distance equal to 1,7–2,0 facet diameters. Colourless unsclerotized zone around frontal hair scars, in furrowed band extending between eyebridges, and around area normally occupied by interocular suture. Patch of four hair scars between eyebridges in holotype, none in male paratypes. Palpi (1–1,6 — 1,5–2,3) 1,44 times length of head. Antenna 15-segmented, 1,57 times length of palp and 0,45 times length of wing; scape (fig. 33) slender, constricted in middle region, 0,79 times length of head and 4,36 times length of pedicel. Pedicel subpyriform, constricted in basal half, 0,67 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th–12th, two on 13th–15th; pair of ascoids on 6th–12th segments. Thirteenth segment 0,77 times length of 12th.

Wing (fig. 34) brown with whitish section of fringe from R_2 – M_2 ; erect hair brownish-white to brown; venation and infuscation of membrane much as in previous species, but both forks at same level, basal to level of tip of Cu; tip of R_4 placed above apex of wing; conspicuous discrete thickenings on several veins, especially R_3 , M_3 and Cu. Wing length, 2,6–3,0 mm.

Legs brown with creamy tarsi.

Abdominal vestiture brown. Genitalia (figs 30–31) with aedeagus long and slender. Inner processes without barbed appearance; outer surfaces smooth, not stepped in profile; points less divergent than in *divaricatus* sp. n. Outer processes well separated from inner. Between coxites, aedeagus sheathed in membrane with two small lateral areas of sclerotization (*s* in fig. 31), perhaps homologous with dorsal plates of *tauricornis* group. Basal apodeme with very narrow neck region and broad, rounded apical region, like blade of a paddle. Ninth sternite with sclerotized, thickened posterior margin, slightly concave in midline; anterior margin far less distinct. Coxite inflated laterally; 3–4 short sensory setae on membrane connecting coxite to aedeagus. Style elongate, twice as long as coxite, strongly constricted beyond hair scars, outer side deeply concave; blade almost even in thickness from base to tip. Ninth tergite with pseudospiracular openings well separated; dorsal sclerites corrugated. Cercopod with 5–6 retinacula.

Female. (Piri Forest series.) Vestiture more honey-brown in colour.

Head with eyebridges separated by distance equal to 2,0–2,5 facet diameters, connected by curved interocular suture. Small patch of scars between eyebridges;

indistinct band of lesser sclerotization, coincident with furrow, extending from frontal scars to scars between eyebridges. Palpi (1-1,5 — 1,5-2,4) 1,44 times length of head. Antenna 1,39 times length of palp and 0,39 times length of wing; scape only 0,36 times length of head and 2,10 times length of pedicel; pedicel 1,01 times length of post-pedicel. Two hirsute sensory pits on 3rd-5th antennal segments, one on 9th-13th, two on 14th, last two segments damaged. Ascoids as in female *zuluensis*.

Wing length, 2,7-3,1 mm.

Genitalia essentially as in *zuluensis* so far as can be seen from small number of specimens, but subgenital plate with shoulders narrower than base.

Material examined: 6 ♂, 3 ♀, SOUTH AFRICA, King William's Town, Piri Forest, 10.3.1953 (G. H. Satchell); 2 ♂, Natal, Karkloof, 1.1.1957 (B. Stuckenberg); 2 ♂, Natal, Karkloof, 8.1.1957 (B. & P. Stuckenberg); 2 ♂, Natal Drakensberg, Cathedral Peak area, Indumeni Forest, 23.3.1955 (B. Stuckenberg); 1 ♂, N.E. Transvaal, Tzaneen, Magoeba's Kloof, 24.4.1953 (G. H. Satchell).

Of the specimens in the above list, all that were collected from localities other than Piri Forest differ from my description in some important characteristics. For example, the Drakensberg males have shorter outer aedeagal processes and a thick-necked basal apodeme. One of the Karkloof males has elongate and strongly divergent inner aedeagal processes, and styles as in *divaricatus* sp. n. The Magoeba's Kloof male has the outer aedeagal processes equal in length to the inner, which are curved strongly upward at the tips; very short retinacula, and an almost unsclerotized ninth sternite.

***Clytocerus (Notoclytocerus) corniculatus* sp. n.**

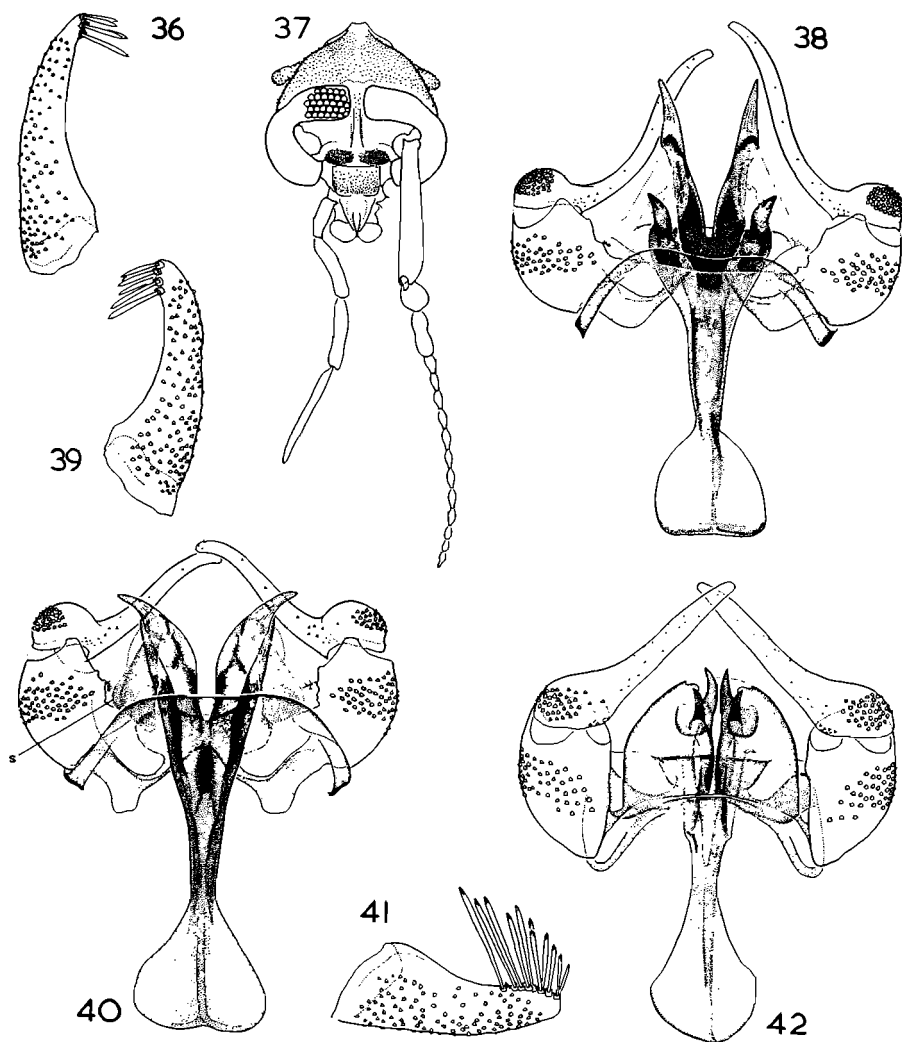
Differs from *chyuluensis* in that it has small corniculae, short, blunt, downwardly directed outer aedeagal processes, and styles that are as long as in *chyuluensis* from Piri Forest, but with the basal region small and compact. Female unknown.

Male. Vestiture mainly rather light brown, without specialized crests or tufts; pale honey-brown on notum. Denuded head (fig. 37) 0,96 times as long as broad, with vertex inflated, obtuse; corniculae small with dome-shaped sensilla, some with discernible apical papilla. Eyebridges of five facet rows, separated by distance equal to 1,4-1,7 facet diameters. Colourless unsclerotized zone in frontal region more or less as in *chyuluensis*, but less well defined. Furrow extending from frontal scar patches to between eyebridges. Band of scars between eyebridges. Palpi (1-1,7 — 1,8-2,7) 1,54 times length of head. Antenna 15-segmented, 1,56 times length of palp and 0,46 times length of wing; scape 0,8 times length of head and 4,1 times length of pedicel. Pedicel subpyriform, constricted in basal half, 0,7 times length of post-pedicel. One or two hirsute sensory pits on 4th antennal segment, one on 8th-12th, two on 13th-15th; 5th segment with one large and one small ascoid (holotype) or one small ascoid (paratype) and pair of ascoids on 6th-12th segments. Thirteenth segment 0,78 times length of 12th.

Wing with brownish-white section of fringe from R_2-M_2 ; brownish-white and brown erect hair; venation and infuscation as in *chyuluensis*, but radial fork slightly basal to medial. Wing length, 2,5-2,8 mm.

Legs light brown with creamy tarsi.

Genitalia (figs 36, 38) with aedeagus shorter and less slender than in *chyuluensis*. Inner processes less divergent at tips than in *chyuluensis*. Outer processes less than



Figs 36–42. (36–38) Holotype male of *Clytocerus (Notoclytocerus) corniculatus* sp. n.: (36) cercopods (37) head; (38) coxites, styles and aedeagus. (39–40) *Clytocerus (Notoclytocerus) divaricatus* sp. n., male: (39) cercopod; (40) coxites, styles and aedeagus of holotype. (41–42) Holotype male of *Clytocerus (Notoclytocerus) palliolatus* sp. n.: (41) cercopod; (42) coxites, styles and aedeagus.

half length of inner, tips blunt and downwardly directed, bases incrassate in holotype, making aedeagus as a whole appear broad between coxites. Sheath with lateral areas of sclerotization indistinct. Basal apodeme of holotype with neck region less slender than in *chyuluensis*; apical region truncate. Ninth sternite with sclerotized, thickened posterior margin, concave in midline. Coxite inflated laterally towards base; sensilla on membrane connecting coxite to aedeagus. Style elongate, more than twice length of coxite; basal region small, compact, strongly constricted beyond scars, outer side deeply concave; holotype with blade slightly thicker in distal half. Ninth tergite with

pseudospiracular openings well separated; dorsal sclerites corrugated. Cercopod slender, with small hair scars and 5-6 short retinacula (9 in paratype).

Material examined: Holotype ♂, RHODESIA, Chirinda Forest, Mt Selinda, 25.1.1955 (B.R.S.-P.G.). Paratype, 1 ♂, Vumba Mt, near Umtali, 18.1.1955 (B.R.S.-P.G.).

***Clytocerus (Notoclytocerus) divaricatus* sp. n.**

A mainly honey-brown species without specialized crests or tufts, the male without corniculae. Closest to *chyuluensis*, from which it is distinguished by the stout scape, aedeagus with inner processes strongly divergent, and much greater development of the lateral areas of sclerotization in the aedeagal sheath. Female not certainly identified.

Male. Vestiture on head and its appendages honey-brown to brown. Denuded head 0,93 times as long as broad, with vertex inflated, obtuse; corniculae absent. Eyebridges of five facet rows, narrowly separated by distance equal to 0,8-1,5 facet diameters; patch of scars between eyebridges; variably developed band of unsclerotized cuticle from frontal scar patches between eyebridges to level of posterior row of facets, generally forming furrow anteriorly, ridge between eyebridges; small area of unsclerotized cuticle in region normally occupied by interocular suture. Palpi (1-1,5 — 1,5-2,3) 1,41 times length of head. Antenna 1,59 times length of palp and 0,44 times length of wing; scape stout, inflated in appearance, 0,73 times as long as head and 3,95 times as long as pedicel. Pedicel subpyriform, constricted in basal half, 0,70 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th-12th, two on 13th-15th; pair of ascoids on 6th-12th segments. Thirteenth segment 0,73 times length of 12th.

Thoracic vestiture honey-brown to brown. Wing brown, with brownish-white section of fringe between R_2-M_2 ; erect hair brownish-white to brown; venation and infuscation of membrane as in *chyuluensis*. Wing length, 2,6-2,9 mm.

Legs brown with creamy tarsae.

Genitalia (figs 39-40) with aedeagus and styles less slender than in *chyuluensis*. Inner processes stout, not appearing barbed, not stepped in profile, strongly divergent so that they often touch or almost touch the outer processes. Between coxites, aedeagus sheathed in membrane with two lateral areas of sclerotization (*s* in fig. 40), much larger than in *chyuluensis*, perhaps homologous with dorsal plates of *tauricornis* group. Basal apodeme with narrow neck region and broad, rounded apical region, like blade of a paddle. Ninth sternite with sclerotized, thickened posterior margin, generally slightly concave in midline; anterior margin indistinct. Coxite less inflated laterally than in *chyuluensis*; style less than twice length of coxite, even more strongly constricted and concave in profile beyond hair scars than in *chyuluensis*, blade noticeably tapered. Ninth tergite with pseudospiracular openings well separated; dorsal sclerites corrugated. Cercopod with 5-7 retinacula.

Material examined: Holotype ♂, SOUTH AFRICA, Grahamstown, Fern Kloof, 16.2.1953 (G. H. Satchell No. 567). Paratypes (coll. G. H. Satchell): 7 ♂, with holotype; 3 ♂, same locality, 5.3.1953; 1 ♂, same locality, 24.2.1953. Other specimens: 5 ♂, N.E. Transvaal, near Tzaneen, Westfalia, 24.4.1953 (G. H. Satchell); 1 ♂, N.E. Transvaal, Tzaneen, Magoeba's Kloof, 27.4.1953 (G. H. Satchell); 1 ♂, E. Cape Province, Zuurberg Range north of Addo, 10.4.1961 (B. & P. Stuckenberg); 1 ♂, Zululand, Ingwavuma district, Lebombo, Gwalaweni Forest, 2.1957 (Stuckenberg);

1 ♂, Natal, Umzimkulwana Valley, Oribi Gorge Reserve, 21–28.11.1960 (B. & P. Stuckenberg).

palliolatus group

Aedeagus with intromittent region enclosed dorsally and laterally by a cuticular hood or capsule, apparently a development of the ninth sternite, from which one or both pairs of aedeagal processes project to some extent; aedeagal processes small and thorn-like, or inner processes with tips blunt and fringed. Style constricted and curved outwards beyond hair scars, concave on outer side.

This group contains *africanus* Tonnoir from Nigeria, *fasciatus* Tonn. and *carbonarius* Tonn. from Uganda, *flavitaris* (Enderlein) from Tanzania, and two new species. The figures of *flavitaris* given by Quate (1963), taken from the holotype and only specimen, indicate that it is a separate species, not a synonym of *africanus* as Tonnoir (1939) suggests. However, Quate's preparation was clearly compressed and I cannot fully understand the structure he has drawn. I have therefore omitted *flavitaris* from the key on p. 428.

***Clytocerus* (*Notoclytocerus*) *palliolatus* sp. n.**

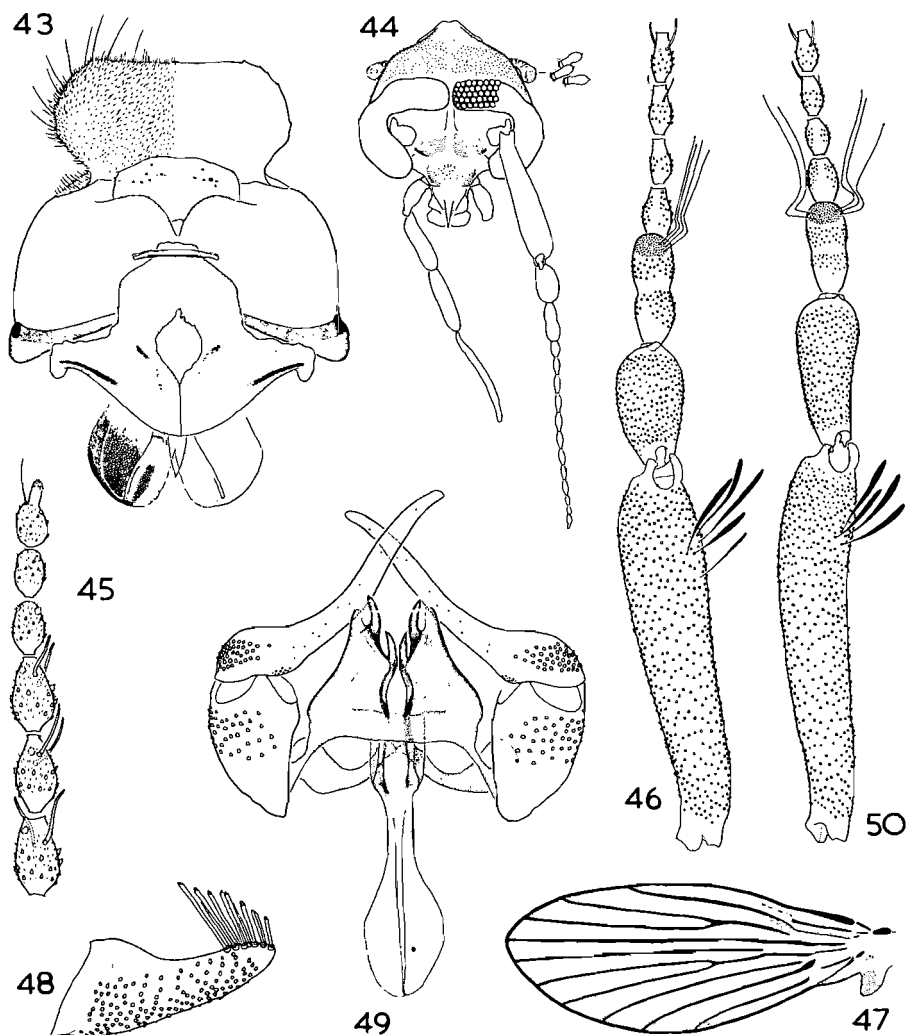
A brown species, the male with part of the mesopleuron covered in a pile of short brown scales. Distinguished from other members of the group by the broad, rounded, unconstricted form of the aedeagal capsule, and by the close-set, thorn-like, sharply pointed dorsal aedeagal processes.

Male. Vestiture on head and its appendages brown. Denuded head (fig. 44) 0.89 times as long as broad, with vertex short, inflated at level of insertion of corniculae, obtuse; corniculae small, sensilla on apical region club-shaped with apical papilla (inset to fig. 44). Eyebridges of five facet rows, very narrowly separated by distance equal to 0.4–0.7 facet diameters; no scars between eyebridges; well-marked band of unsclerotized cuticle, coincident with furrow, from frontal scars, between eyebridges to line of unsclerotized cuticle behind posterior row of facets; interocular suture faintly marked, thickened medially. Palpi (1–1.5 — 1.6–2.5) 1.59 times length of head. Antenna (figs 45–46) 1.53 times length of palp and 0.48 times length of wing; scape stout, about 0.89 times length of head and 3.18 times as long as pedicel. Pedicel pyriform, 1.18 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th–12th, two on 13th–15th; pair of ascoids on 6th–12th segments. Thirteenth segment 0.71 times length of 12th.

Thorax with notum clothed in brown hair, lengthening gradually from anterior region to between wings, not forming crest; mesopleuron with pile of short brown scales behind head. Wing (fig. 47) rather narrow, unusually rounded distally; fringe whitish from R_2 – M_2 ; erect brown hair on most veins; pattern of sclerotization as in other species; forks at same level, slightly basal to level of tip of Cu. Wing length, 2.5–2.8 mm.

Legs brown with cream-coloured tarsi.

Abdominal and genital vestiture pale. Genitalia (figs 41–42) robust; aedeagus short, compact; aedeagal processes thorn-like. Dorsal processes broad-based, close-set, touching or almost touching in midline; tips divergent, projecting from capsule or enclosed. Ventral processes usually more widely separated, not projecting from capsule.



Figs 43-50. (43-47) *Clytocerus (Notoclytocerus) palliolatus* sp. n., female and male: (43) subgenital plate and spermathecae of allotype female; (44) head of holotype male; (45) antennal tip of holotype; (46) base of antenna of holotype; (47) male wing. (48-50) Holotype male of *Clytocerus (Notoclytocerus) constrictus* sp. n.: (48) cercopod; (49) coxites, styles and aedeagus; (50) base of antenna.

Capsule unsclerotized posteriorly in dorsal midline, brown elsewhere; rounded in outline, partly fused to the variable ninth sternite and attached to bases of coxites by pair of sclerotized processes as shown. Coxite without sensory setae at base; less inflated than in *zuluensis* group. Style stout, about 1.47 times as long as coxite, constricted beyond basal scars to form shallow concavity in profile; blade tapered, with numerous sensilla, especially on ventral surface, seen as colourless spots on brown background. Ninth tergite with pseudospiracular openings widely separated; dorsal sclerites not corrugated. Cercopod stout, with ventral surface only slightly convex,

as in *Peripsychoda* Enderlein; about 10–12 retinacula, the longest about half as long as cercopod.

Female. Vestiture more of a honey-brown colour anteriorly; no pile on mesopleuron.

Head with vertex inflated at level occupied by corniculae in male. Eyebridges separated by distance equal to 1,7–2,2 facet diameters, connected by curved interocular suture. No scars between eyebridges; no reduction of sclerotization between frontal scars and interocular suture. Palpi (1–1,5 — 1,6–2,3) 1,6 times length of head, first three segments incrassate. Antenna 1,39 times length of palp and 0,43 times length of wing; scape only 0,45 times length of head and 2,19 times length of pedicel; pedicel ovoid, 1,27 times length of post-pedicel. One or two small hirsute sensory pits on 3rd antennal segment, two on 4th–5th, one on 9th–13th, two on 14th–16th. Pair of digitate ascoids on 5th–13th segments. Fourteenth segment 0,68 times length of 13th.

Wing length, 2,7–3,0 mm.

Subgenital plate (fig. 43) with shoulders rounded, narrower than base; distal lobes large, broad, with apical concavity slight to shallow and sensory setae normal. Dorsal flap rounded, contiguous with genital sac; sensilla appearing as colourless spots on brown, sclerotized background. Spermathecal sculpturing reticulate. Apodemes partly fused in midline to leave large aperture at level of lateral wings. Transverse cuticular structure with hyaline sheath above posterior extension of apodemes. Ovipositor 1,85 times length of subgenital plate; cerci slender, curved, with line of about eight setae on inner side in basal half, and about eight peg-shaped sensilla dorso-laterally.

Material examined (all coll. G. H. Satchell): Holotype ♂, SOUTH AFRICA, E. Transvaal, near Nelspruit, 20.4.1953 (Satchell No. 1064). Paratypes: 3 ♂, 1 ♀ (allotype) and 3 ♀, with holotype.

***Clytocerus (Notoclytocerus) constrictus* sp. n.**

Differs from *palliolatus* and all other species in the elongate-pyriform shape of the pedicel, and in the aedeagal capsule, which is strongly constricted in the distal half. The dorsal aedeagal processes are widely separated. Female unknown.

Male. Vestiture of holotype as in *palliolatus*.

Denuded head 0,90 times as long as broad, vertex longer than in *palliolatus*, inflated at level of insertion of corniculae; corniculae larger than in *palliolatus*, with sensilla on apical region lacking apical papillae, otherwise intermediate in shape between those of *zuluensis* and *palliolatus*. Eyebridges of five facet rows, narrowly separated by distance equal to 0,7–1,1 facet diameters; no scars between eyebridges; small spot of sclerotized cuticle on midline representing centre of interocular suture; well-marked band of unsclerotized cuticle, coincident with furrow, from frontal scars, between eyebridges to line of unsclerotized cuticle behind posterior row of facets. Palpi (1–1,5 — 1,6–2,4) 1,59 times length of head. Antenna (fig. 50) 1,59 times length of palp and 0,5 times length of wing; scape 0,94 times length of head and 2,84 times length of pedicel, progressively broadening from narrow base to broad apical half. Pedicel elongate pyriform, 1,48 times length of post-pedicel. Two hirsute sensory pits on 4th antennal segment, one on 8th–12th, two on 13th, one or two on 14th–15th. Holotype with one normal and one reduced ascoid on 6th segment, 7th–12th segments with normal pairs. Thirteenth segment 0,70 times length of 12th.

Holotype wing smaller and less sclerotized than in most *palliolatus*; forks well basal to level of tip of Cu, radial basal to medial. Wing length (holotype), 2.5 mm.

Genitalia (figs 48–49) robust; aedeagus short, compact, with processes thorn-like. Dorsal processes broad-based, widely separated; tips divergent, projecting from capsule. Ventral processes inserted more basally, close-set, tips divergent. Capsule unsclerotized posteriorly in dorsal midline, brown elsewhere; laterally constricted in distal half, partly fused to the reduced ninth sternite, attached to bases of coxites by pair of sclerotized processes as shown. Coxite without sensory setae at base, less inflated than in *zuluensis* group. Style stout, elongate (about 1.77 times length of coxite), constricted and curved beyond basal scars to form concavity in profile; blade tapered, with sensilla as in *palliolatus*. Ninth tergite with pseudospiracular openings widely separated; dorsal sclerites not visible. Cercopod almost as in *palliolatus*, but retinacula shorter.

Material examined: Holotype ♂, SOUTH AFRICA, E. Transvaal, near Nelspruit, 20.4.1953 (G. H. Satchell No. 1067). Paratypes: 1 ♂, RHODESIA, near Umtali, Vumba Mt, 18.1.1955 (B.R.S.-P.G.); 1 ♂, Rhodesia, Rhodes-Inyanga National Park, 13.1.1955 (B.R.S.-P.G.).

The two males from Rhodesia are larger than the holotype (wing length, 2.8–3.12 mm), are more darkly sclerotized and have smaller ventral aedeagal processes.

The following new genus from the Ethiopian Region is based upon a new species from Rhodesia together with two similar forms, *Psychoda pallida* and *Brunettia obscura*, described by Tonnoir (1922, 1939a) from the Congo and Uganda. It is one of the most distinctive and isolated genera in the Subfamily Psychodinae. It resembles the Indian *Psychoda distincta* Brunetti—which is not a *Psychoda*, or a *Telmatoscopus* as Quate (1962) supposed—in its elongate clypeus, reduced eyebridges, pattern of hair scars on the head and general characteristics of the wing venation, but is separated from that species by the structure of the genitalia and antenna and the greater reduction of the eyebridges. To a lesser extent it resembles *Setomima* Enderlein.

Genus *Mystropsychoda* gen. n.

Derivation: Mystron (Gr.) = Spoon + *Psychoda*.

Gender: Feminine.

Type-species: *Mystropsychoda rhodesiensis* sp. n., by present designation.

Head with vertex short, clypeus and mouthparts elongate; second palpal segment shorter than third; labellum bulbous; eyebridges and interocular suture absent; hair scars on frons contiguous with those on vertex, separated by broad median scar-free band. Antenna 16-segmented; scape elongate, its base enlarged to form lateral wing; pedicel subspherical; post-pedicel with basal bulb and its hair scars enlarged on dorsal side; remaining flagellar segments smaller in overall size, mostly with a pair of short digitate ascoids; necks short; verticillar hairs sparse, spreading, not cupuliform; last segment with narrow, tapered apiculus ending in 1–2 sensory cones.

No special thoracic scent organs; no hair scars on prothorax. Wing with membrane hairy; pointed apex at tip of R_5 ; radial sector pectinate; forks at same level or medial basal to radial; Sc long and distinctly connected to R_1 ; male wing with curved brush of hairs ventrally near costal node.

Male with genitalia simple, symmetrical; aedeagus scoop- or spoon-shaped, rounded,

without processes or projections; basal apodeme laterally flattened, very short and thin; coxites connected at base below apodeme by simple transverse cuticular bridge, without lobes or projections; coxite two or more times as long as broad; style as long as coxite or longer, little incrassate at base, pointed at tip; cercopod with cluster of subequal retinacula at tip and generally a row of long, fine, non-deciduous hairs basal to retinacula. Female with subgenital plate longer than broad; distal lobes wide and shallowly divided.

Type-species: *Mystropsychoda rhodesiensis* sp. n.

Key to males of *Mystropsychoda*

1. Radial and medial forks at same level; medial fork with M_1 and M_2 normally developed, normally separated beyond bifurcation.....2
- Medial fork basal to radial; medial fork with M_1 and M_2 thin and close-set beyond bifurcation (Rhodesia).....***rhodesiensis* sp. n.**
2. Coxite and style etiolated; style far longer than coxite; aedeagus with intromittent region distinctly shorter than style (Ghana, Congo).....***pallida* (Tonnoir) comb. n.**
- Coxite and style normal; style equal in length to coxite; aedeagus with intromittent region about as long as style (Congo).....***obscura* (Tonnoir) comb. n.**

Mystropsychoda rhodesiensis sp. n.

A medium-sized species, its vestiture pallid grey-brown, variegated with white. Distinguished from *pallida* (Tonnoir) comb. n. and *obscura* (Tonnoir) comb. n. by the position of the forks, the medial placed before the radial and both well before the level of the tip of Cu, and by the broadened apical half of the aedeagus and angulated ninth sternite.

Male. Exoskeleton pale brown.

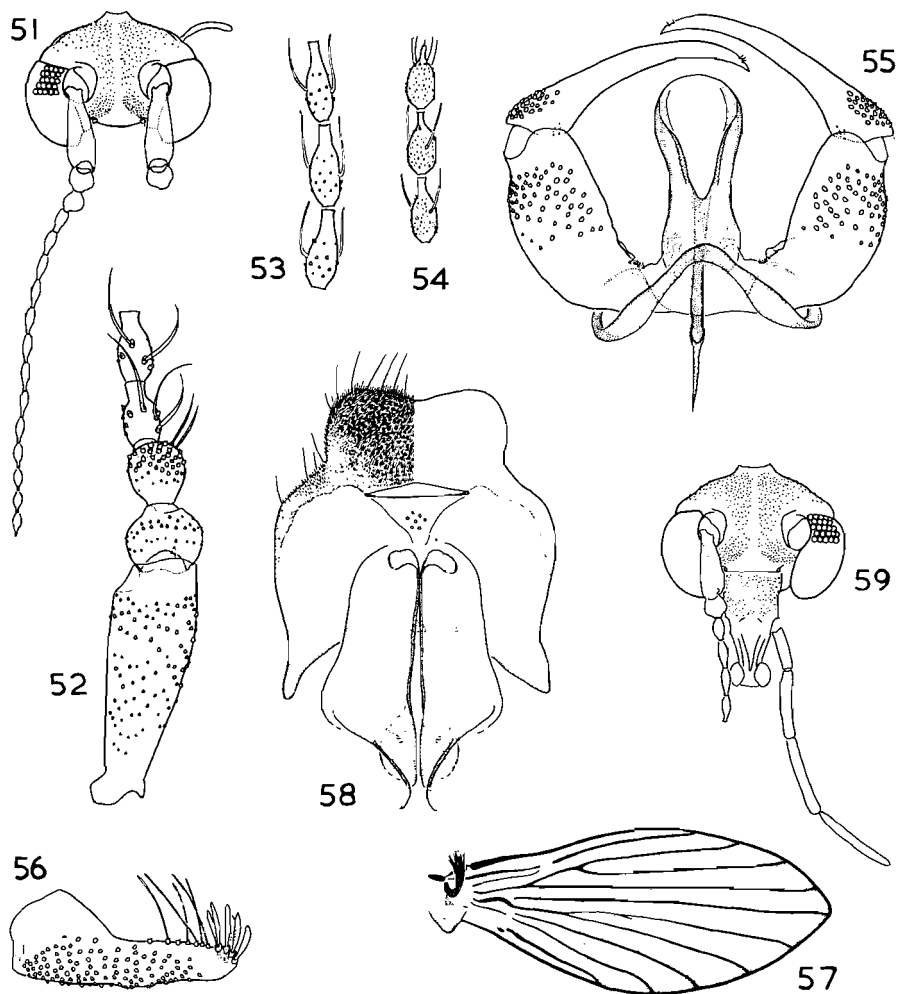
Head and base of antenna thinly clothed in pale grey-brown hair. Denuded head (fig. 51) with clypeus and mouthparts lost; vertex with hair scars large, sparse; broad scar-free zone behind eyes. Flattened club-shaped organ attached to left-hand side of head as shown (right-hand organ lost during processing), presumably homologous with pair of similar structures present in *obscura*; surface of organ microsetose, lacking pits or sensilla of types found on corniculae in other genera. Anterior tentorial pits overhung by lateral scars on frons. Scars on frons smaller than those on vertex. Antenna (figs 52–54) 0,48 times length of wing; scape 3,82 times length of pedicel; pedicel broader than long; post-pedicel and following three segments with enlarged hyaline setae: flattened, curved and sharply pointed; remaining antennal segments with normal fine verticillar hairs; paired ascoids on 5th–15th antennal segments. Necks of flagellar segments without noticeable rims, short (about 0,24 (15th segment)–0,5 times length of basal bulb) with raised collar at point of junction with basal bulb. Last segment with apiculus naked, terminated by sensory cone, with circlet of about eight long sensory setae at base.

Wing (fig. 57) with decumbent hair on membrane brown except for white patches between tips of veins; erect hair on veins bronze-brown with scattered white patches; fringe brown with white interruptions at tips of R_5 , M_3 and Cu, and some white hairs along costa and at tip of R_2 . Interruption in costa beyond costal node, and in

R₁ beyond junction with Sc. Medial fork basal to radial; M₁ and M₂ thin and close-set beyond bifurcation (compare radial fork); M₁₊₂ thickened and arched strongly upwards at base. Membrane with pattern of pale-brown sclerotization as shown in figure. Wing length, 2,7 mm.

Legs brown, with metatarsae, and on some legs the first 1-2 tarsal segments, white.

Genitalia (figs 55-56) with aedeagus broadened and scoop-like in apical half; basal apodeme extended backwards between coxites to narrow waist region of aedeagus where it bifurcates to form rim of scoop. Coxite with scars clustered in distal half; group of about seven fine sensory setae at base of coxite on inner side; style slightly longer than coxite, distal third curved inwards, tip sharply pointed with 2-3 fine sensory setae subterminally on outer surface. Ninth sternite well sclerotized, naked,



Figs 51-59. (51-57) Holotype male and (58-59) allotype female of *Mystropsychoda rhodesiensis* gen. et sp. n.: (51) head; (52) base; (53) segments 8-10 and (54) tip of antenna; (55) coxites, styles and aedeagus; (56) cercopod; (57) wing; (58) subgenital plate and spermathecae; (59) head.

strongly angulated in midline. Ninth tergite angular posteriorly; pseudospiracular openings fused. Cercopod rapidly constricted in basal half; ventral surface only slightly convex, as in *Peripsychoda*; about seven short, subequal retinacula; non-deciduous hairs about twice as long as retinacula.

Female. Vestiture almost as in male.

Head (fig. 59) without club-shaped organs on vertex; clypeus elongate, some lateral scars enlarged. Palpi (1-1,5 — 1,7-1,8) very elongate, 1,6 times length of head and 0,3 times length of wing; 1st segment with few dome-shaped sensilla on inner side; 2nd segment with few hyaline sensory rods on outer side. Antenna 0,46 times length of wing; scape only 2,7 times length of pedicel; some enlarged sockets on dorsal side of post-pedicel, but otherwise no sign of large hyaline setae as in male; paired ascoids commencing on 4th antennal segment.

Wing as in male except for lack of curved brush of hairs and more basal position of medial fork. Wing length, 2,8-3,1 mm.

Genitalia (fig. 58) with cluster of sensilla at base of almost unsclerotized genital sac; dorsal flap a low triangle, slightly more than half width of distal lobes; spermathecae small, with faint reticulate sculpturing; apodemes with a pair of broad lateral flaps extending backwards to level of base of genital sac. Ovipositor 1,6 times length of subgenital plate; cerci tapered, not curved.

Material examined (all coll. B.R.S.-P.G.): Holotype ♂, RHODESIA, near Umtali, Vumba Mt, 18.1.1955. Paratypes: 1 ♀ (allotype), with holotype; 1 ♀, Rhodesia Rhodes-Inyanga National Park, 13.1.1955.

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